(1)

NAME OF CONTRACTOR:	Paul M. Raccah
CONTRACT NUMBER:	DAAK 70-83-K-0047
EFFECTIVE DATE OF CONTRACT:	2/1/83
EXPIRATION DATE OF CONTRACT:	1/31/86
REPORTING PERIOD:	SECOND QUARTER [Part One]
PRINCIPAL INVESTIGATOR:	PAUL M. RACCAH
PHONE NUMBER:	(312) 996-3403

"Plasma Passivation of Selected MCT Samples Pt. 1

THE VIEWS AND CONCLUSIONS CONTAINED IN THIS DOCUMENT ARE THOSE OF THE AUTHORS AND SHOULD NOT BE INTERPRETED AS NECESSARILY REPRESENTING THE OFFICIAL POLICIES, EITHER EXPRESSED OR IMPLIED, OF THE U. S. GOVERNMENT.

NVL — SAMPLE DATA

Plasma Conditions: 60 watts RF power
+40 VDC sample bias
.5 torr O_2

Samples:

#1 488Å Plasma oxide on LPE
6 min. growth time
Rockwell #5-271B LPE - (111), λ = 3.87 μm, 25-28 μm thick
p-type, $4.8 \times 10^{16}/cm^3$ @ 77K
mobility $238 cm^2 v^{-1} s^{-1}$ @ 77K
x = .32 ± .01 (by EER)

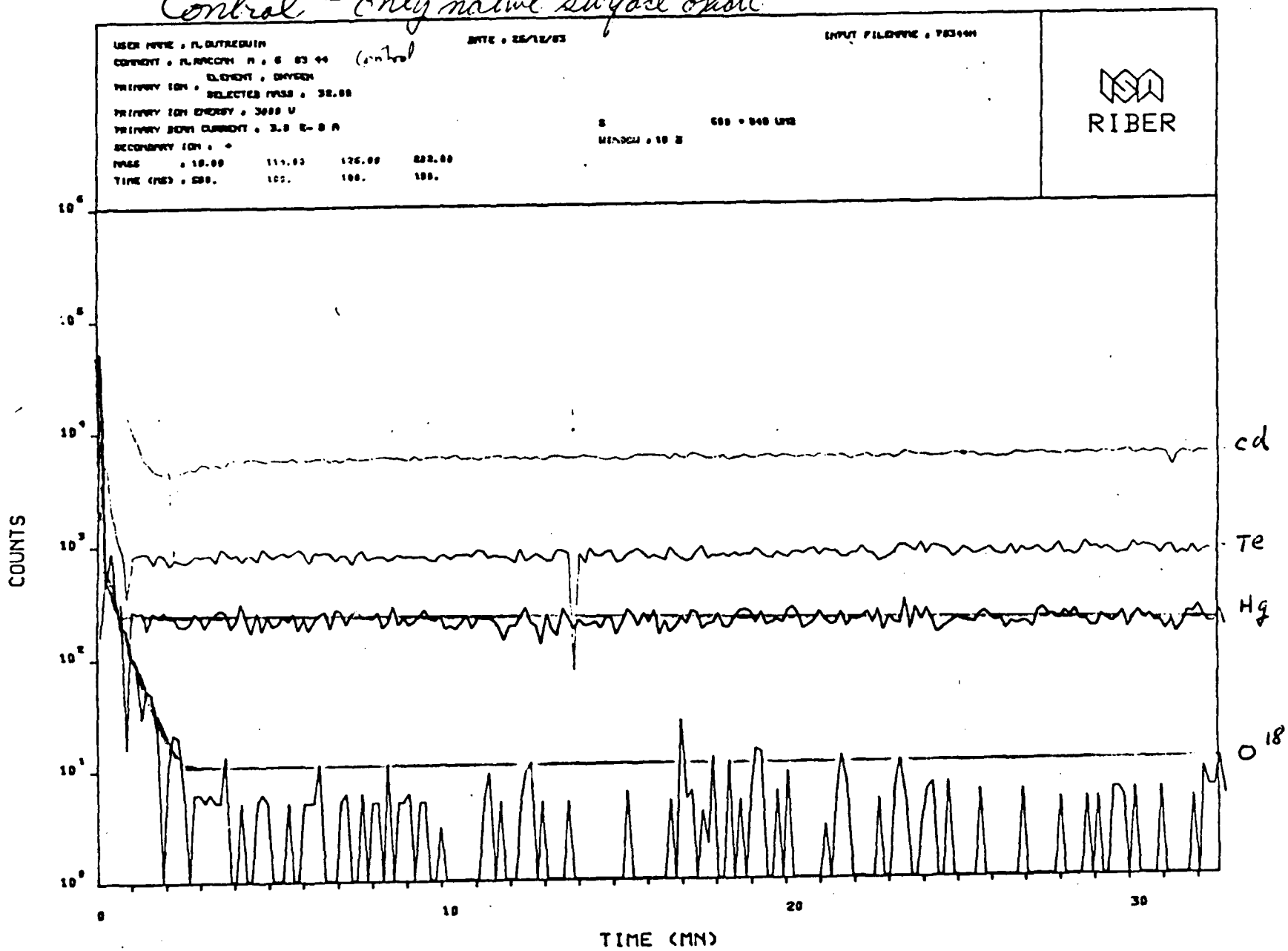
#2 445Å Plasma oxide on Bulk
5 min. growth time
Cominco #15(321)-10B - (111), Bulk
n-type, $-2.7 \times 10^{15}/cm^3$ @ 300K
$-1.7 \times 10^{14}/cm^3$ @ 77K
mobility $5.6 \times 10^3 cm^2 v^{-1} s^{-1}$ @ 300K
$6.4 \times 10^4 cm^2 v^{-1} s^{-1}$ @ 77K
x = .295 ± .05

#3 a 237Å Plasma oxide on LPE
2 min. growth time

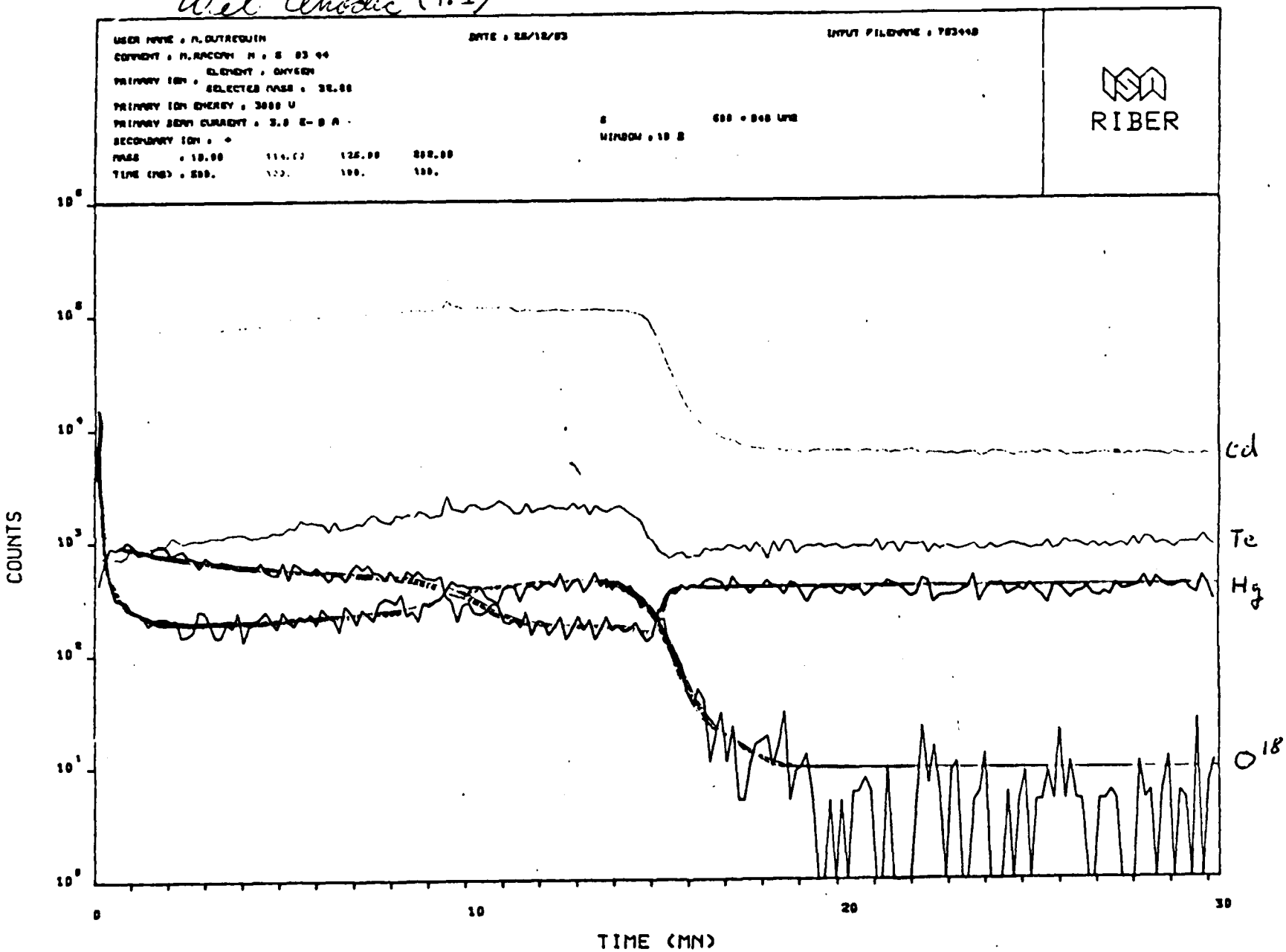
b 363Å Plasma oxide on LPE
6 min growth time
Fermionics #4318 LPE - (111), λ = 12.5 μm, 20 μm thick
n-type, $-1.1 \times 10^{14}/cm^3$ @ 77K
mobility $1.4 \times 10^5 cm^2 v^{-1} s^{-1}$ @ 77K
x = .2

SIMS DATA

Control - only native surface oxide

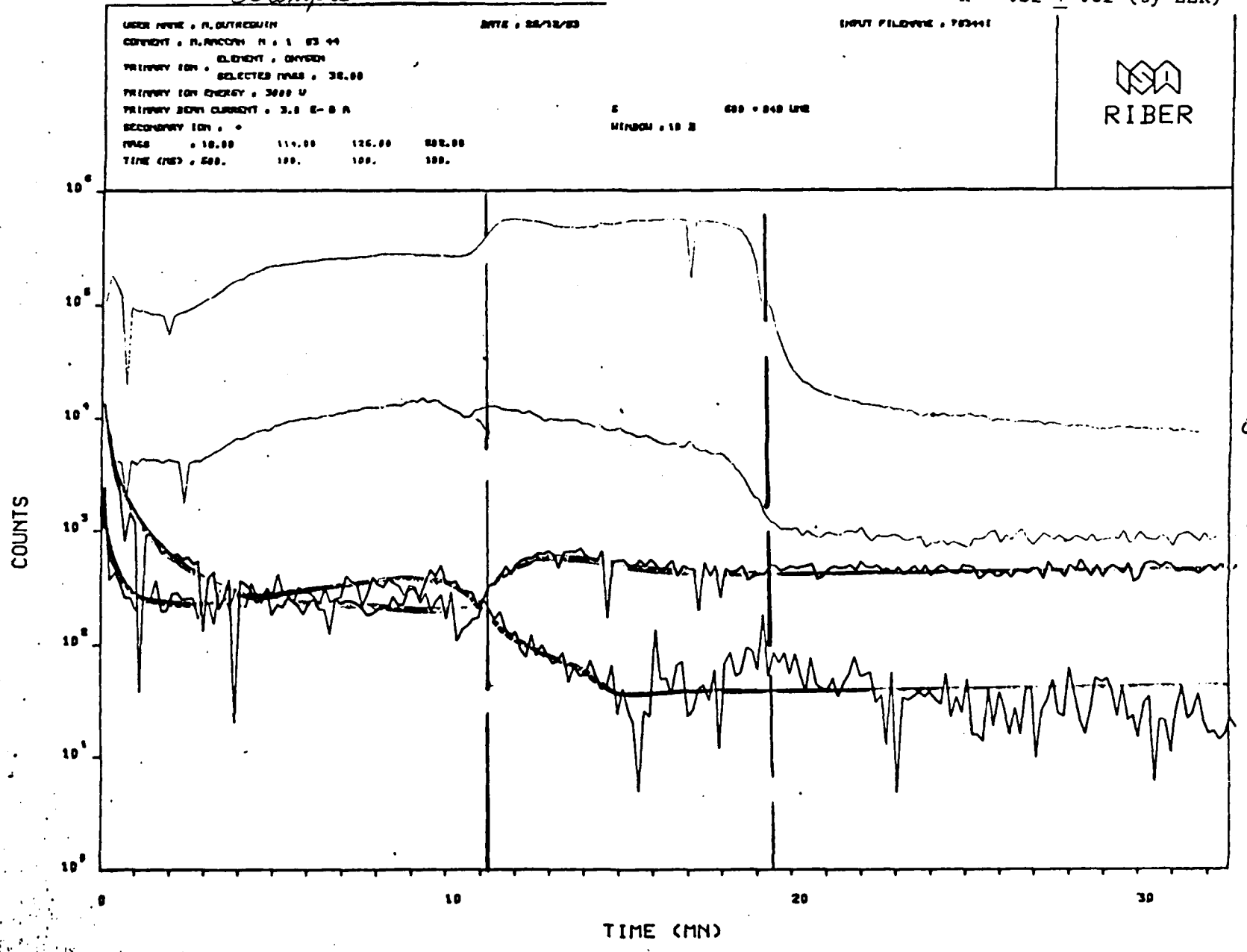


Wet Anodic (T.I)

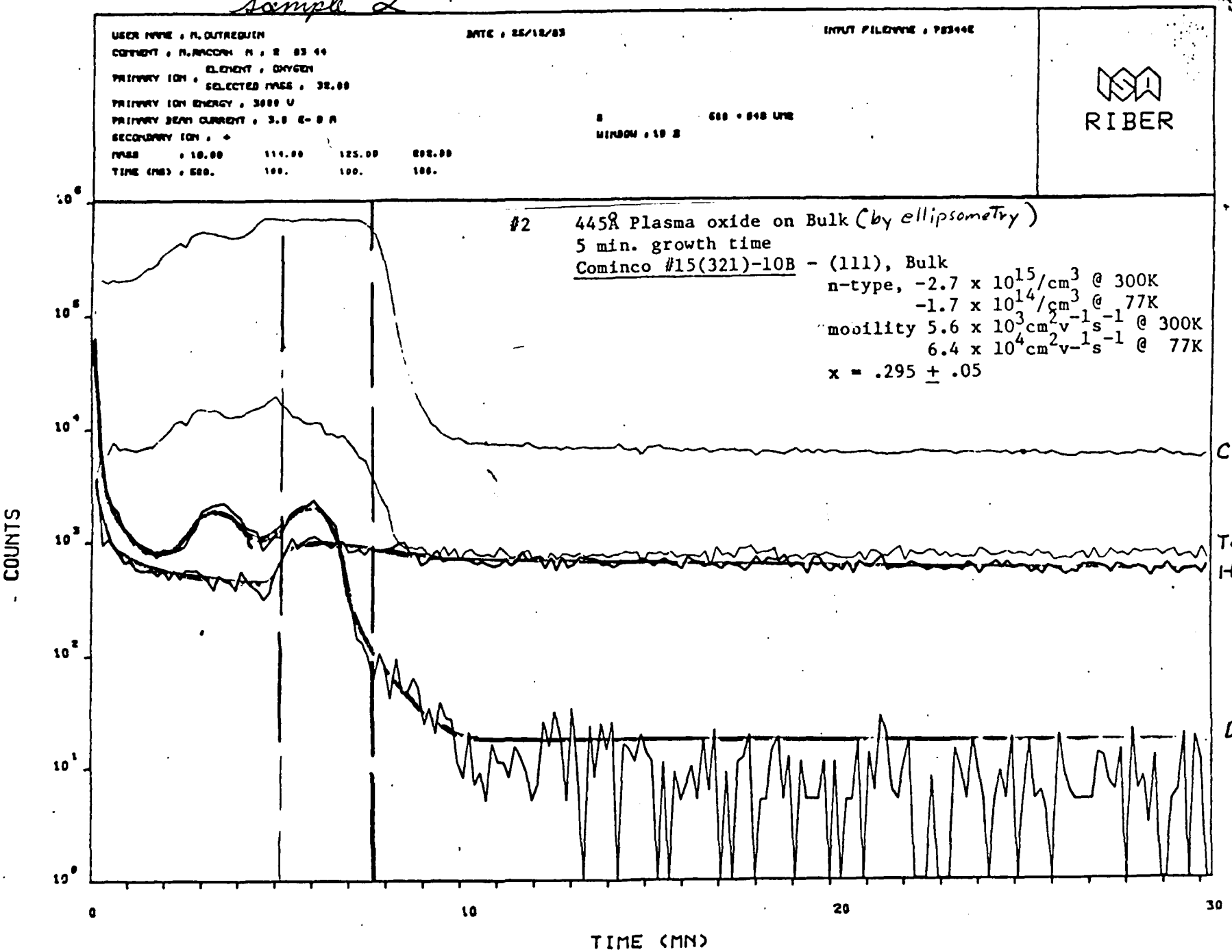


#1 488Å Plasma oxide on LPE (by ellipsometry)
6 min. growth time
Rockwell #5-271B LPE - (111), λ = 3.87 μm, 25-28 μm thick
p-type, $4.8 \times 10^{16}/cm^3$ @ 77K
mobility $238 cm^2 v^{-1} s^{-1}$ @ 77K
x = .32 ± .01 (by EER)

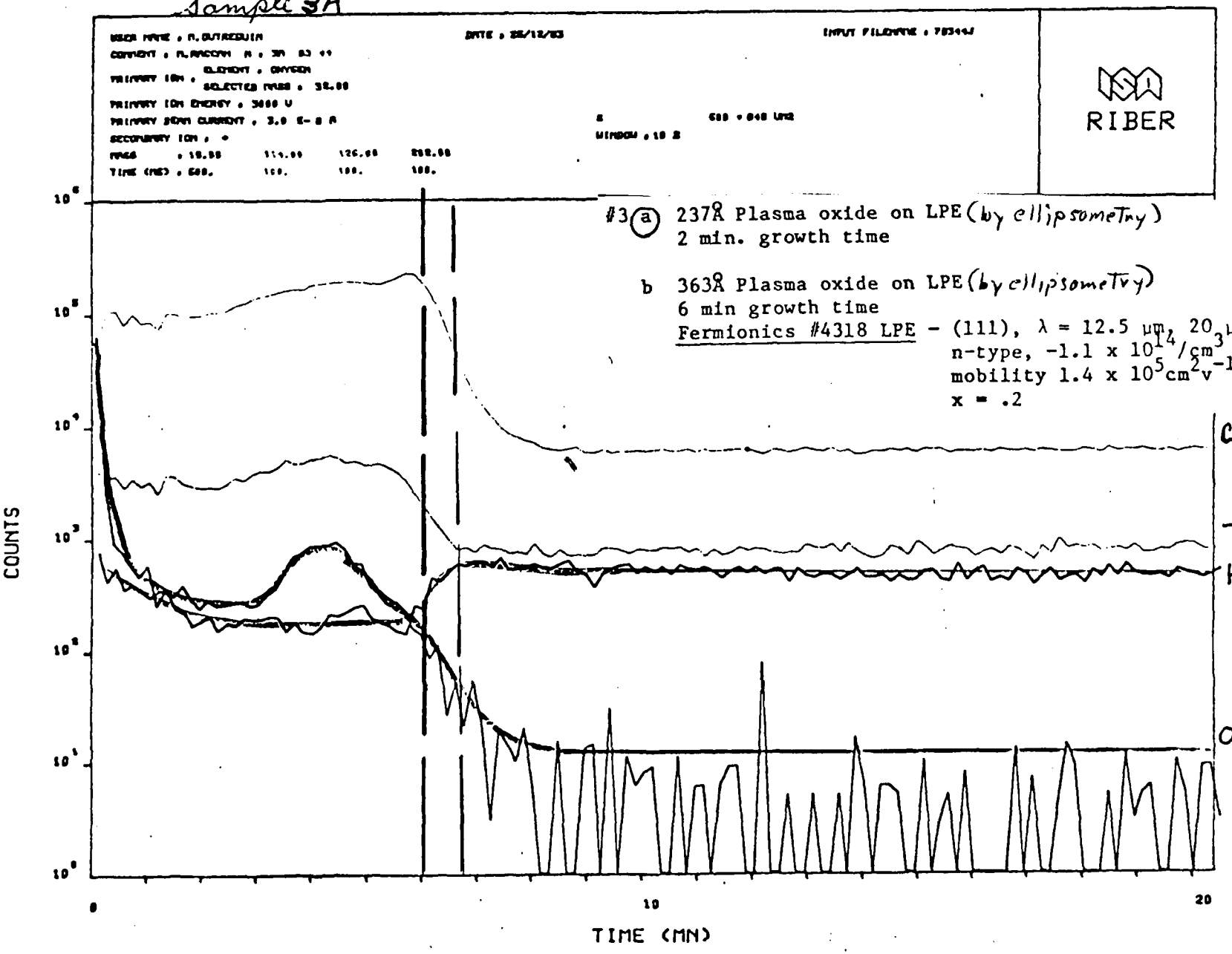
Sample #1



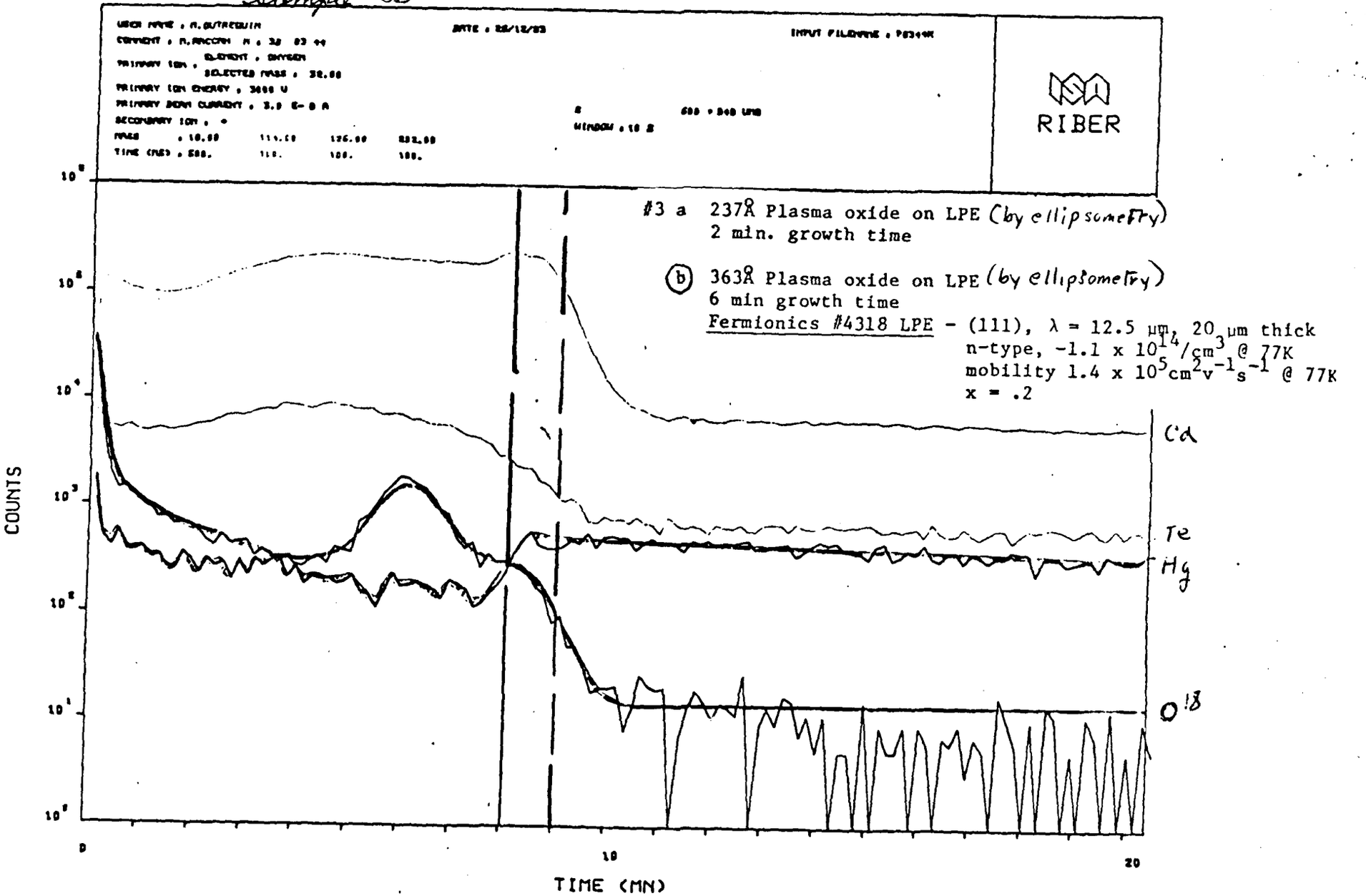
Sample #2


USER NAME : M. DUTREQUIN
DATE : 25/10/83
INPUT FILENAME : P8344E
COMMENT : M.RACCAH M : 8 83 44
PRIMARY ION : ELEMENT : OXYGEN
SELECTED MASS : 32.00
PRIMARY ION ENERGY : 5000 V
PRIMARY BEAM CURRENT : 3.0 E-8 A
SECONDARY ION : +
MASS : 10.00 114.00 125.00 202.00
TIME (MN) : 500. 100. 100. 100.
RASTER : 10 X
RIBER
#2 445Å Plasma oxide on Bulk (by ellipsometry)
5 min. growth time
Cominco #15(321)-10B - (111), Bulk
n-type, -2.7 x 10^15/cm^3 @ 300K
-1.7 x 10^14/cm^3 @ 77K
mobility 5.6 x 10^3 cm^2v^-1s^-1 @ 300K
6.4 x 10^4 cm^2v^-1s^-1 @ 77K
x = .295 ± .05
Cd
Te
Hg
D18
COUNTS
TIME (MN)
0
10
20
30

Sample # 3A


RIBER
#3 (a) 237Å Plasma oxide on LPE (by ellipsometry)
2 min. growth time
b 363Å Plasma oxide on LPE (by ellipsometry)
6 min growth time
Fermionics #4318 LPE - (111), λ = 12.5 μm, 20 μm thick
n-type, -1.1 x 10^14/cm^3 @ 77K
mobility 1.4 x 10^5 cm^2 v^-1 s^-1 @ 77K
x = .2
Cd
Te
Hg
O18
COUNTS
TIME (MN)
0
10
20

Sample #3B


RIBER
#3 a 237Å Plasma oxide on LPE (by ellipsometry)
2 min. growth time
(b) 363Å Plasma oxide on LPE (by ellipsometry)
6 min growth time
Fermionics #4318 LPE - (111), λ = 12.5 μm, 20 μm thick
n-type, -1.1 x 10^14/cm^3 @ 77K
mobility 1.4 x 10^5 cm^2 v^-1 s^-1 @ 77K
x = .2
Cd
Te
Hg
O 18
COUNTS
TIME (MN)
0
10
20